REMARKS

In response to the objections, the title is amended, and the paragraph at lines 6-33 of page 5 is corrected. Claim 7 is amended to correct a typographical error kindly pointed out by the Examiner. Claim 15 contains the limitations of claim 3, in independent form.

Specification

In response to the rejection of claim 1, the specification is amended to add textual description of the structure shown in the drawing as it would be understood by anyone of ordinary skill in the art, in order to support the amended claims.

Figs. 2, 3 and 4 of the drawing as filed show a substantially flat surface of the amalgam 27, in a plane transverse to the axis 12, with the electrode and auxiliary amalgam aligned on the tube longitudinal axis (see also Fig. 1). However, those of ordinary skill know that the amalgam surface need not be flat. The important consideration is that the amalgam does not merely extend as a line transverse to the axis, but rather presents a substantial area aligned properly to receive heat radiated from the electrode. The amended specification describes what is shown in the drawing, broadly as one of ordinary skill would understand what is the significance of the embodiments depicted.

Art rejection - US 4,047,071 (hereinafter "Busch")

To the extent that the rejection over Busch might be maintained against amended claims 1m 2, 5, 7 and 8, reconsideration is requested. Applicants respectfully traverse the allegation at lines 6-7 of page 3 of Paper No. 9, "the carrier being arranged in a plane transverse to the longitudinal axis."

Busch teaches a low pressure fluorescent lamp having a mass of silicate containing an amalgam-forming metal 10 which is the principal source of mercury, a start-up or auxiliary amalgam 13, and another start-up amalgam 14. The main amalgam is applied in the form of a droplet of material (col. 2, lines 39-43; col. 3, lines 45-51 and 56-59) located at the juncture of the pinch seal 4 and the flare 4. The start-up amalgams "are used in smaller amounts, however, only about 10% of the amount of the main amalgam" (col. 2, lines 45-47), arranged as described below.

"Cap 11 also functions as a supporting surface for start-up amalgam 13. Another start-up

amalgam 14 is positioned on the seal 5" (col. 4, lines 25-27). Cap 11 is clearly shown in Fig. 2, and is in the form of a tubular structure whose axis is longitudinal, parallel to the lamp longitudinal axis. The cap 11 surrounds the electrode coil 9. The droplet of material is shown as being on an exterior surface of the tubular structure, so that even if the droplet were flattened to a quasi planar shape, that plane would be parallel to the longitudinal axis. Similarly, the other start-up amalgam 14 is on the side of the pinch seal 5, and this side is substantially parallel to the longitudinal axis.

Further, it is clear that the auxiliary amalgam is not aligned axially with the electrode.

Accordingly, nothing in Busch teaches nor at all suggests that the auxiliary amalgam is shaped and located as claimed.

Art rejection - US 3,562,571 (hereinafter "Evans")

To the extent that the rejection over Evans might be maintained against the amended claims, reconsideration is requested because Evans does not teach an amalgam extending in mutually orthogonal directions transverse to the lamp axis.

Like Busch, Evans teaches a fluorescent lamp having a main amalgam 28 and an auxiliary amalgam 30. The Evans main amalgam is retained by a generally cylindrical collar 27 which is placed around the stem 14, and is concentric with the longitudinal axis of the lamp. The Evans auxiliary amalgam is "carried by a wire mesh holder 32 which is fastened to one of the lead wires and extends to the press seal 18 of the associated stem 14" (col. 4, lines 1-3).

As described at lines 34-42 of col. 4, the auxiliary amalgam 30 is preferably a narrow strip that is pressed into the planar surface of the holder 32. Two legs of the holder 32 extend along and grip the sides of the stem 14, with the amalgam entirely to one side of the stem. Alternatively as shown in Fig. 4, a blob of amalgam 38 is on a piece of sheet metal 34 extending to one side of the stem 14a.

Accordingly the Evans teaching is that the auxiliary amalgam, however shaped, is placed to one side of the stem, and in fact has a tongue T between much of the amalgam and the electrode. As a result the effective distance of the auxiliary amalgam from the electrode is relatively large, and is not arranged for fastest heating.

Art rejection - Busch in view of US 3,688,148 (hereinafter "Fedorenko")

To the extent that the rejection of claims 3 and 4 over Busch in view of Fedorenko might be maintained against the substituted claims 15-16, reconsideration is requested one of ordinary skill would consider that Fedorenko teaches away from making the claimed combination.

The embodiment of Fedorenko Fig. 1 teaches that the ball of auxiliary amalgam 12 is contained within the exhaust tube, and the exhaust tube is apparently closed at both ends because the evacuation opening 12 is located at the middle of the tube. Thus the exhaust tube is not and does not suggest a support for an amalgam carrier, but rather the "substantially spherically expanded hollow portions 10" (col. 4, lines 14, 15) are alternative containers for the amalgam. There is no suggestion of using the exhaust tube to support an amalgam carrier where the carrier is arranged in a plane transverse to the tube longitudinal axis amalgam. To do so would require a great change in the shape of the exhaust tube, and, without the benefit of the teachings of the instant application, there is no apparent reason to make those changes. In particular, by making the required changes the whole advantage of Fedorenko, by which the auxiliary amalgam location is readily changed, would be lost.

The embodiments of Fedorenko Figs. 2 and 3 teach still further away from the claimed combination. The amalgam 12 is within a container 17 having an inner tube for locating the amalgam. Each of the container 17 and inner tube are quite elongated in the direction of the fluorescent tube longitudinal axis. This strongly militates against any suggestion of modifying the structure to support a carrier which extends transverse to the longitudinal axis, and carries an auxiliary amalgam which extends substantially in two orthogonal directions transverse to the longitudinal axis.

With respect to claim 16, the word "onto" is significant. This means that the carrier is on the outside of the exhaust tube; and "press-fitted" means that some portions of the carrier must extend around the exterior of the exhaust tube. Thus a structure which exists entirely inside the exhaust tube, such as the Fedorenko container 17, is different and not suggestive of a carrier which is fitted "onto" the exhaust tube. Again, there is an important effect of the limitation that the amalgam extend in two mutually orthogonal directions: those of ordinary skill would believe there is not sufficient room for the claimed amalgam if it follows the Fedorenko teaching of being inside the exhaust tube, which in turn passes (usually axially) through the stem.

Accordingly, no combination of Busch and Fedorenko suggests claims 15 or 16.

Art rejection - Busch in view of Evans

To the extent that the rejection of claims 6, 9, 10 and 11 over Busch in view of Evans might be maintained against these claims as dependent from amended claim 1, reconsideration is requested because no combination of Busch and Evans suggests an auxiliary amalgam and carrier which are aligned axially with respect to the electrode. Only Fig. 4 of Evans shows an auxiliary amalgam which is at all like "extends substantially in two mutually orthogonal directions"; and this structure places the amalgam well off to the side of the claimed location. Any modification to place the amalgam axially with respect to the electrode requires a major change in thinking and in structure.

With respect to claim 11, compared with Evans, which teaches a spacing of more than 15 mm between that amalgam and the electrode, much more than "optimization of workable ranges" is involved. Evans teaches a location of the auxiliary amalgam off to one side, well below the interior end of the stem. The claimed spacing cannot be achieved with such an arrangement. Further, where a dimensional change of more than 5:1 is involved, this is not mere optimization. This is a different approach not suggested by any combination of Busch and Evans.

CONCLUSION

All formal matters have been corrected, and the claims shown to be patentable. Early favorable action on the merits of the application is respectfully requested.

Respectfully submitted,

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MARKED-UP PARAGRAPHS

On page 1, before line 1, replace the title as follows:

[Low-pressure mercury vapor discharge lamp]
LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH IMPROVED AUXILIARY AMALGAM

Replace the paragraph at lines 6-33 of page 5 as follows:

Figure 1 shows a first embodiment of a low-pressure mercury vapor discharge lamp in accordance with the invention, which is provided with a (glass) discharge vessel 10 having tubular end portions 11; 11'. The discharge vessel 10 encloses, in a gastight manner, a discharge space 18 containing an ionizable filling comprising less than 3 mg mercury and an inert gas, for example a 75/25 mixture of argon and neon. In the embodiment shown, the discharge vessel 10 comprises two tube portions 13; 13' each having a tubular end portion 11; 11' with a longitudinal axis 12; 12'. The end portions 11; 11' are jointly fixed in a lamp cap 50, which is shown very diagrammatically. In an alternative embodiment, a so-called integrated lamp cap is employed wherein a copper-iron ballast or an electronic gear control is situated, and which lamp cap is further provided with, for example, so-called E14 or E27 connection means. At tube ends 14; 14' situated opposite to the lamp cap 50, the tube portions 13; 13' are in communication with each other via a channel 15. The discharge vessel may alternatively be embodied so as to be a single elongated or (multiple-) bent tube, for example a tube bent in the form of a hook. The discharge vessel 10 is provided, at a side facing the discharge space 18, with a luminescent layer 16. In each end portion 11; 11', an electrode 20; 20' is arranged on a so-called stem 21, 21' in the discharge space 18. The electrode 20; 20' is preferably arranged transversely to the longitudinal axis. In an alternative embodiment of the low-pressure mercury vapor discharge lamp, the electrode is axially mounted in the end portion. In addition, in a further alternative embodiment of the low-pressure mercury vapor discharge lamp, an external electrode may be provided at an end portion of the discharge vessel to bring about a capacitive coupling with a lamp power supply. Current supply conductors 30A, 30B; 30A', 30B' extend from the electrodes 20, 20' through the stem 21; 21' in the end portion 11; 11' and issue from the

discharge vessel 10 to the exterior. At least one stem [11; 11'] 21; 21' carries an auxiliary amalgam (not shown in Figure 1) which is provided on a carrier 25; 25', which carrier 25; 25' is provided in the stem 21; 21' by means of a supporting wire 23; 23'. In the embodiment shown, both stems 21; 21' carry an auxiliary amalgam. In accordance with the invention, (a part of) the carrier 25; 25' is arranged in a plane transverse to the longitudinal axis 12; 12'.

MARKED-UP CLAIMS

1.(amended) A low-pressure mercury vapor discharge lamp comprising a discharge vessel (10), [which] said discharge vessel (10) [encloses] enclosing a discharge space (18) containing a filling of mercury and an inert gas in a gastight manner, and said discharge vessel (10) comprising:

tubular end portions (11; 11'), which each have a longitudinal axis (12; 12'),

electrodes (20; 20') [being] arranged in the discharge space (18) for generating and maintaining a discharge in the discharge space (18),

and at least an auxiliary amalgam (27) [being] provided on a carrier (25; 25') in the discharge vessel (10) in the proximity of at least one of the electrodes (20; 20'),

characterized in that

at least a part (25A) of the carrier (25; 25') is arranged in a plane transverse to the longitudinal axis (12; 12'), and

the auxiliary amalgam extends substantially in two mutually orthogonal directions transverse to said longitudinal axis, and is disposed substantially in line with said at least one of the electrodes in a direction parallel with said longitudinal axis.

7.(twice amended) A low-pressure mercury vapor discharge lamp as claimed in claim 1, wherein the carrier (25; 25') is arranged at a side of the electrode (20; 20') facing away from the discharge space [(13)] (18).